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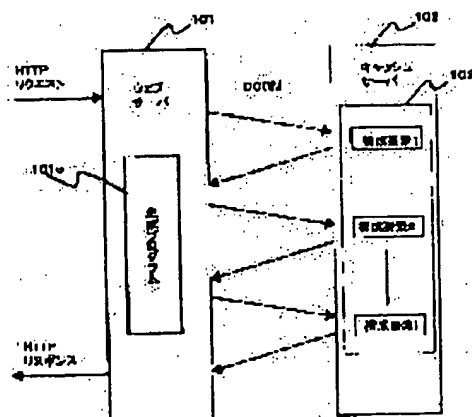
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YASUKAWA HIROSHI**(54) DEVICE AND METHOD FOR OUTPUTTING DOCUMENT****(57)Abstract:**

PROBLEM TO BE SOLVED: To dynamically generate a web page at a little calculation cost.

SOLUTION: When a request is sent from a client terminal 20, a dynamic page generation program 101c of a web server 101 synthesizes a web page corresponding to a prescribed protocol type by successively extracting correspondent components from a memory 102a of a cache server 102 by a remote procedure call on the basis of the information of a user profile database 101a. When reading page components out of the memory 102a of the cache server 102, a hash table 102b determines a pointer from the GUID of the page component and extracts the correspondent page component. The web page composited by arranging the desired component is returned to the client terminal 20.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the document output technique of having been suitable for generating a web page dynamically dynamically especially, about the document output technique which outputs documents, such as a web page, based on the demand from a user.

[0002]

[Background of the Invention] On the website on the Internet, the web page to which it not only sends the web page of the contents fixed based on the perusal demand of a user, but it changed the contents dynamically dynamically according to a user's occupation, sex, age, liking, the visit hysteresis to a site, etc. is sent increasingly. In order to have generated the dynamic dynamic web server, composition of a web page etc. needed to be performed based on access to a database, and an access result, great computation time was required, and it had become the bottleneck of web access.

[0003]

[Problem(s) to be Solved by the Invention] This invention is made in consideration of the above situation, and aims at offering the technique which generates documents, such as a web page from which the contents change dynamically dynamically, at little count cost.

[0004] Moreover, this invention distinguishes automatically whether a dynamic web page should be outputted or a fixed web page should be outputted, and aims at offering the technique which outputs the fixed web page which corresponds immediately in the case of a fixed web page.

[0005]

[Means for Solving the Problem] According to this invention, in order to attain the above-mentioned purpose, the configuration as a publication is adopted as a claim. Here, before explaining invention to a detail, the publication of a claim is explained in supplement.

[0006] Namely, in order to attain the above-mentioned purpose according to one side face of this invention A user's document output request from a memory means to memorize two or more document components which constitute two or more documents with which it being dynamically generated by the document output unit, respectively, and being outputted to it based on the document output request from user is planned, and; client equipment It is based on the means to receive and the user attribute sent with the; above-mentioned document output request. The identifier of the document component contained in the document to output He is trying to establish a means to take out the document component which corresponds from the above-mentioned memory based on the identifier of the document component by which the; above-mentioned decision was made with a means to determine, and to arrange in a document, and a means to output the document with which the; above-mentioned document component has been arranged to the above-mentioned client equipment.

[0007] In this configuration, since the component which can be used common to two or more documents with which being constituted dynamically is planned is memorized in memory (semiconductor memory) per component, the storage maintenance of all the information required for document composition can be carried out, without increasing memory space so much. Therefore, a dynamic document can be immediately compounded and outputted at little computer cost.

[0008] A user attribute is the language which an informational category and the information specified beforehand, for example, a favorite artist's information, document perusal agent's class which a user uses, and the user chose. A document perusal agent is browsers, such as Internet Explorer (InternetExplorer, trademark) and Netscape Navigator (NetscapeNavigator, trademark), personal digital reed SUTANTSU and the perusal software of a cellular phone with a web function, and the perusal software of an intelligent fixed-line telephone or an intelligent home electrical-and-

electric-equipment product which are used with a personal computer etc. The document perusal agent who is not restricted to what is performed by computer, but is used with various devices other than a computer is sufficient.

[0009] A document component is identified and read to a meaning using GUID (it explains in full detail to a Globally unique identifier and the back).

[0010] Moreover, according to other side faces of this invention, it is based on a means to receive a user's document output request accompanied by URL from client equipment to a document output unit, and the user attribute sent with the; above-mentioned document output request. When the document which should carry out the; above-mentioned output with a means to distinguish the 2nd document of the 1st document with which it is planned that the document which should be outputted is generated dynamically and outputted, and the fixed contents is distinguished from the 1st document. When the document which should carry out the; above-mentioned output with a means to generate and output a document dynamically corresponding to Above URL is distinguished from the 2nd document, he is trying to establish a means to output the 2nd document currently beforehand generated corresponding to Above URL.

[0011] According to this configuration, the user attribute, for example, a user, has determined whether to output a dynamic document based on whether the document by which the PASONA rise was carried out is needed, or output a static document. Therefore, in ending by the static document, the processing which draws up a dynamic document becomes unnecessary, wasting computer cost is lost, and the throughput as the whole improves.

[0012] In addition, this invention is not only realizable as equipment or a system, but it is realizable as an approach. Moreover, of course, a part of such invention can be constituted as software. Moreover, naturally it is contained [the software product (record medium) used in order to make a computer perform such software, or] in the technical range of this invention.

[0013]

[Embodiment of the Invention] Hereafter, the example of this invention is explained.

[0014] Drawing 1 shows the example which applied this invention to the environment where a document perusal demand and a document output are performed by HTTP (hypertext transfer protocol) as a whole, and the website 10 and the client terminal 20 are connected through the communication networks 30, such as the Internet, in this drawing. [0015] The website 10 has the web server 101, the cache server 102, and the database-management-system 103 grade, and these computer resource is connected through the local area network (LAN) 104. LAN104 is connected to the communication network 30 through the router 105. A web server 101 is a well-known HTTP server, and everything but an HTML document has the CGI program etc. suitably. Moreover, a web server 101 has Cookie database user profile database 101a, and manages Cookie user attribute information. This user attribute information is referred to using Cookie so that it may mention later. Please refer to "http: / /home.netscape.com/newref/std/cookie_spec.html" about the detail of Cookie. You may make it use means other than Cookie, such as managing status information using the argument of a HTTP demand. The status information of Cookie etc. is behind used as conditions, such as redirection, and is explained in full detail behind. In addition, it is desirable to establish a firewall, a demilitarized zone (DMZ), etc. in a website 10 suitably from a viewpoint of security.

[0016] The personal computer and workstation which have been arranged in office or a dwelling are sufficient as the client terminal 20, and a migration terminal is sufficient as it. You may make it connect with a communication network 30 through the gateway which a mobile communications operating company employs in the case of a migration terminal. The client terminals 20 may be a set top box, the home electrical-and-electric-equipment product made intelligent, a portable telephone, and fixed telephone that what is necessary is to, have the function which accesses a communication network 30 in short, and just to have the function (web perusal agent) which peruses the web page which a website 10 offers.

[0017] Although a communication network 30 is the Internet typically, they may be LAN and a broader-based private network.

[0018] Drawing 2 explains the mode of redirection of a HTTP demand, and redirection device 101b changes the purpose URL of a HTTP demand (GET/POST method) into the redirection place URL in this drawing. The redirection place URL is changed accommodative by the existence of language (usable language), a user agent (perusal agent's class), and a PASONA rise, and the count of a visit. Of course, you may make it a redirection place change based on the other conditions.

[0019] A redirection place changes, as shown in drawing 3 . the original pass of the purpose URL -- ".. /" -- ".. the 1/user agent 1 of /language/PASONA-rise-less (the 1)" -- ".. the 1/user agent 1 of /language/PASONA-rise-less (the 2)" -- ".. the 1/user agent 1 of /language/PASONA-rise-less (the 3)" -- ".. it is changed into the pass of the 1/user agent 1 of /language/" with a PASONA rise. "Language" is English, Japanese, Spanish, etc. "User agents" is "Internet Explorer 5" (trademark of U.S. Microsoft Corp.), "Netscape Navigator" (trademark of U.S. Netscape Communications), "i-

mode" (trademark of NTT DoCoMo, Inc.), etc. the case where the flag of PASONA rise existence is "nothing" -- the law of the count v of a visit -- pass changes according to the remainder of a number "3." That is, whenever a predetermined user visits, three kinds of pages are sent out in order. Thus, in "having no PASONA rise", the web page of the contents of immobilization is taken out and outputted from the redirection place pass according to "language", a "user agent", and "the count of a visit." On the other hand, in the case of "with a PASONA rise" (i.e., when the flag of PASONA rise existence is "***"), it is redirected to the pass of CGI with which a HTTP request corresponds, a dynamic web page is generated according to a user's information and a user's attribute specifically held at Cookie database user profile database 101a, and it is returned to a user.

[0020] The information on the "language" used for above-mentioned redirection, "the existence of user agent" and a PASONA rise", and "the count of a visit" is included in the header of a HTTP request, and is supplied to a web server 101 by the HTTP request.

[0021] This point is explained further. Drawing 4 simplifies and explains a HTTP request and a HTTP response, and "language", a "user agent", and Cookie information ("cookie") are included in the header of a HTTP request with various information. In this example, Cookie information is the flag of user ID (GUID, Globally unique identifier), the last visit time to a website, the count of a visit to a website, and the existence of a PASONA rise, as shown in drawing 5. This Cookie information is kept by a user's client terminal 20, and when a user accesses predetermined URL of the website 10 of this example, it is sent with a HTTP request. In addition, you may make it manage the last visit time to a website etc. by user profile database 101a. In addition, that GUID is always peculiar is the identifier guaranteed, for example, an always peculiar thing is the 128 binary integers constituted combining the IEEE machine identifier (MAC Address) guaranteed, time data, a clock sequence, and counted value. About GUID, "http://msdn.microsoft.com/library/books/inol/S10E8.HTP" has detailed explanation in the present, for example at the time of application. Moreover, as an identifier to which the always peculiar thing is guaranteed, UUID (universal unique identifier) which OSF advocated may be used. About UUID, "http://www.opengroup.org/onlinepubs/009629399/apdx.htm" has detailed explanation in the present at the time of application.

[0022] A redirection place is determined based on "language", the "user agent" and "the existence of a PASONA rise" which are sent to a web server 101 as mentioned above, and the information on "the count of a visit."

[0023] Moreover, as shown in drawing 6, the attribute according to Cookie is kept by user profile Cookie database 101a of a web server 101. In this example, a favorite artist's identifier (GUID) etc. is kept for every user ID. Based on this information, a dynamic web page, i.e., the web page by which the PASONA rise was carried out, is generated, and it is returned to the client terminal 20.

[0024] That is, as shown in drawing 7, corresponding to each language and each user agent, k kinds of page components of e(1) - e(k) are loaded to semiconductor memory (random access memory) 102a of a cache server 102, respectively. Namely, page component e(1)1-1-e(k)1-1 is developed by memory 102a to the combination of language 1 and the user agent 1. Page component e(1)1-2-e(k)1-2 are developed to the combination of language 1 and the user agent 2, and a page component is similarly developed about the combination of mxn (m is the number of language and n is the number of user agents). To the combination of Language m and the user agent n, page component e(1) m-n-e(k) m-n is developed by memory 102a. A page component is an element which constitutes a page, for example, are various page configuration units, such as a report for every favorite artist. These page component suits for every language or user agent. Such a page component can change the component of the XML document which becomes origin by XSLT, and can generate it.

[0025] dynamic page generator 101c (drawing 9) of a web server 101 takes out the page component which corresponds based on a user's attribute (for example, a favorite artist -- the user has inputted using an entry form etc. beforehand) as shown in drawing 6, and compounds the web page dynamically.

[0026] As shown in drawing 9, specifically, dynamic page generator 101c of a web server 101 compounds the web page which took out in order the page component which corresponds from memory 102a of a cache server 102 by the Remote Procedure Call (DCOM), and was based on the predetermined prototype based on the information on user profile database 101a. Read-out of the page component from memory 102a of a cache server 102 takes out the page component which determines a pointer and corresponds from GUID of a page component using hash table 102b as shown in drawing 10.

[0027] Consequently, into a predetermined prototype as shown in drawing 11, the web page which has arranged the component of a page request is compounded, and it is returned at the client terminal 20. Drawing 12 shows the example of two page components, and drawing 13 shows the contents of a display of the web page which consists of these. In addition, image data may be arranged fixed and may be loaded to memory 102a of a cache server 102 like the page

component.

[0028] Drawing 8 simplifies and explains actuation of the above-mentioned example, and in this drawing, according to the existence of a PASONA rise, the web page of immobilization is sent out, or a dynamic web page is compounded and it is sent out. The web page of immobilization is taken out from the pass specified by the remainder operation ($v \bmod 3$) of the count v of a visit, and a page is cyclically supplied to the same user. Of course, it is not limited to such a mode. Since the contents of description of drawing 8 itself are clear from drawing, especially explanation is not given.

[0029] Drawing 14 explains the treatment of the component of a web page, and in this drawing, various kinds of contents are changed into XML, and are kept (created XML database). After this, only contents with an effective date are copied to an effective XML database. And it is changed corresponding to various language and a user agent, and is written in memory 102a of a cache server 102 as a component. The contents of memory 102a are updated periodically.

[0030] Since he is trying to memorize the page component used for a dynamic web page to memory 102a of a cache server 102 for every page component according to this example as explained above, a dynamic web page is immediately compoundable, and moreover, since it has memorized in memory per page component, it can be coped with by small memory space. Moreover, since Cookie information notifies whether it is the demand which carried out the PASONA rise to a web server 101, and the web page of immobilization is made to be sent out when a PASONA rise has not been carried out, computer cost decreases. Computer cost can be controlled without sacrificing a user's user-friendliness especially, since it can change with the flag of the existence of a PASONA rise even if it is the demand to the same URL.

[0031] Moreover, since it can notify of the same URL to two or more devices, URL cognition to a user can be made very easy.

[0032] Incidentally, since the page component is kept in the condition of having already become the format which the device finally outputted supports, high-speed processing is possible for it with outputting to a page as it is.

[0033] In addition, this invention is not limited to an above-mentioned example, and can be changed variously. For example, the function of a cache server may be given to a web server. Moreover, two or more cache servers may be prepared and you may make it cluster composition. Moreover, it may change to the CGI program of a web server, and an application program server may be prepared. Moreover, the existence of a PASONA rise may be made to be supplied to a server from a client as an argument of a HTTP request.

[0034]

[Effect of the Invention] According to this invention, as explained above, it is little calculating-machine cost, and a dynamic web page can be compounded, without moreover making memory space increase so much. Moreover, even if it is the environment of a dynamic web page, computer cost can be lessened extremely at a user's demand which has not carried out a PASONA rise. Therefore, according to this invention, the architecture which suits well to a large-scale site especially can be offered. .

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